[onecolumn,useAMS,usenatbib]mn2e amssymb,graphicx,subfigure,color

$c_s 12\kappa_{\rm e.s.}\hat{\kappa}k_{\rm B}L_{\rm E}M\dot{M}_{\odot}\dot{M}_{\rm E}r_{\rm pc}R_{\rm N}R_{\rm S}r_{\rm sg}\sigma_{\rm T}T_{\rm eff}t_{\rm th}t_{\rm ff}\varepsilon$

cm g K km km $\rm s^{-1}$ kpc pc s yr

$p_{\rm rad}p_{\rm gas}Q_{\rm min}r_{\rm min}r_{\rm max}\,\mu{\rm m}\dot{M}l_{\rm E}$

Spectral energy distributions of selfgravitating QSO discs [E. Sirko and J. Goodman] Edwin Sirko and Jeremy Goodman

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firstpage–lastpage 2002

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firstpage

abstract We calculate spectral energy distributions (SEDs) of steady accretion discs at high accretion rates, as appropriate for bright QSOs, under the assumption that the outer parts are heated sufficiently to maintain marginal gravitational stability, presumably by massive stars formed within the disc. The SED is independent of the nature of these auxiliary sources if their inputs are completely thermalized. Standard assumptions are made for angular momentum transport, with an alpha parameter less than unity. With these prescriptions, the luminosity of the disc is sensitive to its opacity, in contrast to standard discs powered by release of orbital energy alone. Compared to the latter, our discs have a broader SED, with a second peak in the near-infrared that is energetically comparable to the blue bump. The energy in the second peak increases with the outer radius of the disc, provided that the accretion rate is constant with radius. By comparing our computed SEDs with observed ones, we limit the outer radius of the disc to be less than 10^5 Schwarzschild radii ($R_{\rm S}$), or about one parsec, in a typical QSO. We also discuss some properties of our minimum-Q discs in the regions where auxiliary heating is dominant ($10^3-10^5 R_{\rm S}$).